REMARKS

In the patent application, claims 1, 2, 4, 5, 7-11, 13, 15-17, 20-25, 27, 31, 33-35 and 37 are pending.

In the office action, all pending claims are rejected.

Applicant has amended claims 1, 13, 27 and 34.

Claims 1, 13, 27 and 34 have been amended such that what is received from or provided by the server is the pre-decoder buffering parameters to ensure that the client is able to play out the packet stream without buffer violation <u>assuming</u> the packet is transmitted over a constant delay.

The support can be found on page 2, lines 29-30; page 4, lines 24-27.

Claims 1 and 13 have been amended to clarify that the information transmitted to the server is an aggregate of the pre-decoder buffering parameters <u>received from the server</u> and <u>the parameters</u> of the jitter buffer estimated <u>in the client</u>. Claims 27 and 34 have been amended to clarify that the information received from the client is an aggregate of the pre-decoder buffering parameters provided to the client and parameters of a jitter buffer estimated in the client.

The support can be found on page 9, lines 11-14; page 9, line 28 to page 10, line 4.

No new matter has been introduced.

At section 3 of the office action, claims 1, 13, 27 and 34 are objected to because the claims state that the packet stream is transmitted over a constant delay, reliable transmission channel, but the system adjusts packet transfer delay, indicating that the delay is not constant.

Applicant has amended claims 1, 13, 27 and 34 such that what is received from or provided by the server is the pre-decoder buffering parameters to ensure that the client is able to play out the packet stream without buffer violation <u>assuming</u> the packet is transmitted over a constant delay, reliable transmission channel.

It is respectfully submitted that the claimed invention is concerned with the server providing to the clients the pre-decoder buffering parameters, chosen such as to ensure that the client is able to play out a packet stream without client buffer violation <u>if</u> the packet stream is transmitted over a constant delay, reliable transmission channel. Because the actual transmission channel is not a constant delay channel and the server has no knowledge of the delay variation, the client is arranged to estimate the parameters of the jitter buffer based on the packet stream transfer delay variation and

to send information to the server. According to the claimed invention, the information sent to the server is indicative of an aggregate of the pre-decoder parameters provided by the server and the parameters of the jitter buffer estimated by the client.

As amended, there is no inconsistence in claims 1, 13, 27 and 34 regarding the transmission channel.

At section 6, claims 1, 2, 4, 5, 7-8, 13, 15, 20-22, 27, 31, 33-35 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Harumoto et al.* (U.S. Patent Application Publication No. 2002/0004840 A1, which has been published as Patent No. 7,016,970 B2, hereafter referred to as *Harumoto*), in view of *Colavito et al.* (U.S. Patent Application Publication No. 2003/0152094, hereafter referred to as *Colavito*), and further in view of *Davies* (U.S. Patent No. 7,043,749).

In rejecting claim 1, the Examiner states that *Harumoto* discloses a method for receiving a packet stream as claimed, except that *Harumoto* fails to disclose that the packet stream transfer delay variation is indicative of a variation in time for transferring the packet stream from the server to the client. The Examiner points to *Colavito* to disclose this feature (Abstract and Figure 5, steps 506-512). The Examiner states that *Harumoto*, in view of *Colavito*, fails to disclose receiving from a server pre-decoder buffering parameters. The Examiner further states that although *Harumoto* teaches how the client knows that the decoder buffer size is 224 Kbytes and the client must have used a vbv delay in order to play the video on the client at a constant rate (paragraphs 8-11), *Harumoto* fails to teach that the client knows this information about the decoder buffer. The Examiner states the *Davies* discloses that a gateway sends video delay information to a terminal and the terminal returns to the gateway the transit (jitter) delay information (Figure 4; col.12, lines 10-35). The Examiner states that it would be obvious for one skilled in the art to have the terminal to receive video delay information from the server (gateway) as taught by *Davies* to determine the decoder buffer information in the client of *Harumoto* and *Colavito* in order to improve network efficiency by calibrating and synchronizing the gateway (server) to the terminal (*Davies* col. 11, lines 25-41).

Applicant respectfully disagrees.

The Claimed Invention

Claim 1 includes the following limitations: (currently amended) A method for receiving a

receiving from a server **pre-decoder buffering parameters** to ensure that the client is able to play out the packet stream without buffer violation assuming the packet stream is transmitted over a constant delay, reliable transmission channel;

estimating in the client packet stream **transfer delay variation** indicative of a variation in time for transferring of the packet stream from the server to the client;

estimating **parameters of a jitter buffer** based on the packet stream **transfer delay variation**; and

transmitting to the server information indicative of **an aggregate** of the **pre-decoder buffering parameters** received from the server and **the parameters of the jitter buffer** estimated in the client.

Let A=pre-decoder buffering parameters, B=transfer delay variation, C= parameters of the jitter buffer, and D=aggregate. Now what is claimed in claim 1 is as follows:

1) the server provides A to the client;

2) the client estimates B;

3) the client estimates C based on B;

4) the client sends the server information indicative of D=A+C.

The Cited References

In order to determine whether the combined teachings of the cited *Harumoto*, *Colavito* and *Davies* references renders the claimed invention obvious, it would be necessary to determine what is the aggregate that is included in the information sent from the client to the server. In particular, the information that the client sends to the server must indicate the pre-decoder buffering parameters received from the server.

The Cited *Harumoto* Reference

The Examiner states that *Harumoto* discloses that the client estimates packet stream transfer delay variation (TS); estimates parameters of a jitter buffer (reception buffer 505) based on TS (Figure 3, paragraphs 174-178) and transmits to the server information of an aggregate of the pre-decoder buffering parameters (decoder buffer 508) and the jitter buffer (steps 301 in Figure 12; paragraph 182). The Examiner further states that *Harumoto* discloses that the client estimates its

own buffer occupancy (video/decoder buffer + reception buffer) and then sends the sum of its occupancy to the server.

It is respectfully submitted that, in Figure 12, step 301, *Harumoto* discloses that the terminal sends the server its Sum. "Sum" is the buffer occupancy delta0 at t=0. At time=Ts, Sum is increased by delta1. As unit time Ts passes, Sum is increased by delta2, delta3, and so on. But after T_delay, the Sum is decreased by L0, L1, L2, ... each time the fixed cycle Tfrm passes [paragraphs 0176-0177]. The Examiner seems to suggest that the buffer occupancy is equivalent to parameters of the jitter buffer, and the decoder buffer 508 is equivalent to the pre-decoder buffering parameters.

It is respectfully submitted that, in the claimed invention, the pre-decoder buffering parameters are received from the server. *Harumoto* does not disclose or suggest that the information regarding the decoder buffer 508 is received from the server.

The Examiner further states that although *Harumoto* teaches how the client knows that the decoder buffer size is 224 Kbytes and the client must have used a vbv delay in order to play the video on the client at a constant rate (paragraphs 8-11), *Harumoto* fails to teach that the client knows this information about the decoder buffer.

It is respectfully submitted that whether the client knows the information about the decoder buffer is irrelevant to the claimed invention. In the claimed invention, what the client receives is the pre-decoder buffering parameters from the server.

The Cited *Davies* Reference

The Examiner states that *Davies* discloses that a gateway sends video delay information to a terminal and the terminal returns to the gateway the transit (jitter) delay information (Figure 4; col.12, lines 10-35).

Davies does not disclose that a gateway sends video delay information to a terminal.

Davies does not disclose that a terminal returns the transit (jitter) delay information to the gateway.

Davies is concerned with calibrating a network gateway in order to synchronize audio output (sound) and visible output (images) from a multimedia terminal are routed through the gateway (Abstract; col. 2, lines 22-29; col.7, lines 25-32). While the audio and video terminals are connected to the gateway, as depicted in Figures 1, the terminals do not receive video delay information from the gateway. The gateway only sends the synchronized audio and video to the terminals so that the

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gateway can determine the time required for the audio and video signals to reach the terminals and to be decoded by the terminals (Figure 9, col.15, lines 47-59).

Figure 4 does not show that a gateway sends video delay information to a terminal and the terminal returns to the gateway the transit (jitter) delay information. Figure 4 only shows three things:

1) after audio and video sources from the multimedia terminal are routed through the gateway at Time t, the encoded audio source would experience three delays (403, 401, 404) before it reaches the audio device, and the encoded video source would experience three delays (402, 408, 406) before it reaches the video device;

2) after the encoded audio source reaches the audio device, there is a decode delay (405) before the audio device produces the sensory audio output, and after the encoded video source reaches the video device, there is a decode and jitter buffer delay (407) before the video device produces the sensory video output; and

3) because the sensory video output is produced earlier than the sensory audio output, an audio/video skew must be provided so that the sensory video output and the sensory audio output can reach a user in synchronization. This means that the gateway must delay in transmitting the encoded video source after the gateway receives the encoded video source from the terminal.

It is respectfully submitted that all the delays 401, 402, 403, 404, 405, 406, 407 and 408 are from the gateway to the audio device, video device and the time of sensory audio/video output. None of these delays is from the gateway to the terminal. The transmission delay of the encoded video source is equal to the sum of audio/video skew 402 and the final audio/video skew. This transmission delay is also called variable sensory output delay (a negative value) applied to the audio signal in order to maintain lip-synch (col.12, lines 9-12).

The passage in col. 12, from line 9 to line 35, does not disclose that a gateway sends video delay information to a terminal and the terminal returns to the gateway the transit (jitter) delay information. This passage only explains different delays one must consider in order to calibrate the gateway. For example, Item (I) is the delay in transmitting encoded video source by the gateway in order that the sensory video output and the sensory audio output are produced in synchronization. Item (J) is equivalent to the transit delay 406 in Figure 4. This item has nothing to do with video delay information sent to a terminal.

Davies discloses how Item (I) is determined and stored in a gateway (col.2, lines 22-45).

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Davies uses RTCP reports between a gateway and a terminal only for determining the round trip delay (Figure 10; col.16, lines 24-39). However, *Davies* does not disclose that a gateway sends video delay information to a terminal and the terminal returns to the gateway the transit (jitter) delay information.

The Cited *Colavito* Reference

The Examiner cites *Colavito* only for disclosing that the packet stream transfer delay variation is indicative of a variation in time for transferring the packet stream from the server to the client.

The Combined Teachings of *Harumoto, Colavito* and *Davies* References

Harumoto does not disclose that the server sends pre-decoder buffering parameters to the clients.

Davies does not disclose that the gateway (server) sends delay information to the terminal (client).

The Examiner cites *Colavito* only for disclosing that the packet stream transfer delay variation is indicative of a variation in time for transferring the packet stream from the server to the client.

For the above reasons, *Harumoto*, in view of *Colavito*, and further in view of *Davies*, fails to render independent claim 1 obvious.

For the same reason, *Harumoto*, in view of *Colavito*, and further in view of *Davies*, fails to render independent claims 13, 27 and 34 obvious.

As for claims 2, 4, 5, 7-8, 15, 20-22, 31, 33, 35 and 37, they are dependent from claims 1, 13, 27 and 34 and include further limitations. For reasons regarding claims 1, 13, 27 and 34 above, *Harumoto*, in view of *Colavito*, and further in view of *Davies*, also fails to render claims 2, 4, 5, 7-8, 15, 20-22, 31, 33, 35 and 37 obvious.

At section 7, claims 9-11 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Harumoto*, in view of *Colavito* and *Davies*, and further in view of *Deshpande* (U.S. Patent No. 7,047,308). The Examiner cites *Deshpande* for disclosing a client and a server uses RSTP messages for communication.
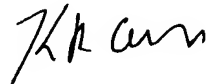
At section 8, claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Harumoto*, in view of *Colavito* and *Davies*, and further in view of *Radha et al.* (U.S. Patent No. 6,700,893, hereafter referred to as *Radha*). The Examiner cites *Radha* for disclosing a single buffer unit.

It is respectfully submitted that claims 9-11, 16, 17 and 23-25 are dependent from claims 1 and 13 and include further limitations. For reasons regarding claims 1 and 13 above, claims 9-11, 16, 17 and 23-25 are also distinguishable over the cited *Harumoto, Colavita, Davies, Deshpande* and *Radha* references.

CONCLUSION

Claims 1, 2, 4, 5, 7-11, 13, 15-17, 20-25, 27, 31, 33-35 and 37 are allowable.

Respectfully submitted,

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